

## Chapter 8

### Aerial Mosaics, Indexes, and Photo Plans

#### 8-1. General

The other chapters of this manual will be used in preparing for the construction of aerial mosaics, indexes, and photo plans. The sections of this chapter are supplemental to these chapters, but will take precedence, except for Chapter 2, in case of contradiction.

#### 8-2. Source Photographs

A photo mosaic or photo index will be made from vertical aerial photography taken for USACE as part of the contract or will be made from vertical aerial photography supplied by USACE.

#### 8-3. Uncontrolled Mosaics and Photo Indexes

The mosaic or index will be prepared by stapling onto a backing board an assembly of prints of the photography.

*a. Overlap matching.* The photographs will be overlap-matched by corresponding images along the flight line. The photographs for each adjacent flight line strip will overlap in the same direction. Air base lengths will be averaged in the image matching of pairs of photographs on the flight line. Parallel, adjoining flight line assemblies will be adjusted in length by incremental movement of the photographs along the flight line until corresponding image matching of adjacent flight line strips can be accomplished insofar as practical for the entire project.

*b. Labeling.* The frames of an uncontrolled photographic mosaic will be overlapped such that the labeling of each frame of photography is hidden. Each strip of a photographic index will be overlapped such that the labeling is visible, and the overlapping of strips will be such that the exposure numbers are visible.

*c. Scale.* The approximate scale of an uncontrolled mosaic will be at the original negative scale unless otherwise specified by contract. The scale of an index of aerial photography will be one-fourth the scale of the photography from which it was made.

*d. Tone matching.* All prints will have similar density and contrast.

*e. Trim.* All prints for indexes will be trimmed with the fiducial marks showing.

#### 8-4. Semicontrolled Mosaics

Semicontrolled mosaics will be constructed from rectified paper prints or from digital imagery, and registered to existing maps of the area.

*a. Ground control requirements.* For most applications, redundant registration to 1:24,000-scale USGS map features will provide sufficient accuracy.

*b. Tone matching.* Adjacent images will be tone and contrast matched to give the appearance of a continuous image.

*c. Feathering.* If the mosaics are constructed from paper prints, the edges of the mosaicked images will be feathered to minimize the ability to perceive the edges.

#### 8-5. Controlled Mosaics

Controlled mosaics will be constructed from differentially rectified orthophotos by using either photomechanical mosaicking or digital imagery methods.

*a. Ground control requirements.* Controlled mosaics will have ground control density and accuracy equivalent to the comparable Class 3 map.

*b. Aerotriangulation requirements.* Controlled mosaics will have aerotriangulation and model setup accuracies equivalent to the comparable Class 3 map.

*c. Tone matching.* Adjacent images will be tone and contrast matched to give a continuous appearance to the image.

#### 8-6. Air Photo Plans

Air photo plan enlargements may be uncontrolled, semicontrolled, or controlled, as required by contract. They will meet the requirements for accuracy and image quality of the mosaic of corresponding accuracy.

#### 8-7. Accuracy Specifications and Cost Considerations

The accuracy specification for controlled and semicontrolled mosaics, indexes, and photo plans will be that

used for topographic maps. Table 8-1 lists the classification of these products.

## 8-8. Labeling and Titling

For geographic orientation, appropriate notations will appear on the mosaic, index, or photo plan, naming several important and prominent geographic and land use features. For an index, the film roll number and exposure number on every tenth photograph will be accentuated with a narrow, short-strip overlay of white paper on which the appropriate numbers have been written. The flight line number will be lettered and accentuated at the end of each flight line strip of photographs in the index.

*a. Annotation.* All overlay lettering and numbering will be neat and readable on both the index assembly and its photographic copies, and will not interfere with the principal land use and topographic features or with the symbols and numbers not accentuated on the individual intermediate photographs. For each mosaic or index, a graphic scale bar will be shown representing the average scale of the vertical photography assembled to form the index.

*b. Title block.* A title block will be placed on the margin and photographically copied as part of the assembly or segments thereof. This title block will have the name of USACE at the head, followed by the project name and number; the photography scale, focal

length, flight height, and date; the engineer's name; and a north arrow and the graphic scale bar—all in a format approved by USACE. The lettering for the title will be of such size that when photographic prints of the index are made to the size and scale required, individual letters will be not less than 1/10 in. in height and will be clearly legible.

## 8-9. Photographic Copying and Printing

The assembly of photographs will be copied on black-and-white or color-negative photographic film so that prints can be made by the contact or projection method of printing.

*a. Projection method requirements.* If the projection method is selected, the scale of the copy negative will be not less than one-third the scale specified for the photographic prints of the index. Whenever the index cannot be copied photographically on one negative, it will be copied segmentally on two or more negatives as necessary. Each negative of a segment of the index will have photographic image overlap of the portion of the index photographed on the preceding negative, which will result in not less than 2 in. overlap at the scale required in photographic prints of the index.

*b. Paper print requirements.* Prints of the assembly will be on double-weight semimatte or resin-coated photographic paper.

**Table 8-1**  
**Classification of Photomap Products**

Description	Controlled Mosaic or Photo Plan	Semicontrolled Mosaic or Photo Plan	Uncontrolled Mosaic	Uncontrolled Photo Plan
USACE Map Accuracy Class	3 or As Specified	N/A	N/A	N/A
Maximum Enlargement Factor from Negative	4 (Maximum) Prefer Negative Scale	5 (Maximum) Prefer Negative Scale	6 (Maximum) Prefer Negative Scale	4 (Maximum)
Degree of Ground Control Required	As for Topographic Mapping	Existing Map Control	Minimum Control to Scale Photos	Minimum Control to Scale Photos
National Map Accuracy Class Vertical Information	Contours Generated from Digital File Required to Rectify Photographs	N/A	N/A	N/A
Rectified Photographs Required	Yes (Ortho-rectified)	Yes	No	No
Tone and Contrast Matched Prints Required	Yes	Yes	Yes	No

**8-10. Deliverables**

The negative or negatives of the photographic index and the required photographic prints thereof will be

furnished to and become the property of USACE. The paper prints of the photography that were assembled to form the mosaic or index will also become the property of USACE.